Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASAHIRO OHKI and YUKITSUNA FURUYA

Appeal No. 1999-1895
Application No. 08/363,315

ON BRIEF

Before THOMAS, GROSS, and BLANKENSHIP, Administrative Patent Judges.

GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 15, which are all of the claims pending in this application. In the Examiner's Answer, the examiner withdraws the rejection of claims 9 through 12. Accordingly, claims 1 through 8 and 13 through 15 remain before us on appeal.

Appellants' invention relates to a radio data communication system using a spread spectrum scheme.

Appellants increase the speed of transmission without increasing the bit error rate by dividing the incoming k-bit signal into n k/n-bit signals. Claim 5 is illustrative of the claimed invention, and it reads as follows:

5. A transmitting apparatus comprising:

converting means for converting a data signal to be transmitted to a k-bit parallel signal, where k is a predetermined integer equal to the value of 2 or greater;

encoding means for mapping each of k/n-bit signals to the signal point locations of a predetermined modulation scheme to output n encoded signals, the k/n-bit signals being obtained by dividing the k-bit parallel signal into n parts, where n is a predetermined integer equal to the value of 2 or greater;

first phase shifting means for causing a phase difference of $B/2^n$ between any two encoded signals adjacent to one another among the n encoded signals;

spectrum spreading means for spreading each of the n encoded signals having said phase difference to output n spectrum spread signals;

combining means for combining the n spectrum spread signals to generate a digital transmission signal; and

radio transmission means for transmitting a transmission wave based on the digital transmission signal.

The prior art reference of record relied upon by the examiner in rejecting the appealed claims is:

De Gaudenzi et al. (De Gaudenzi) 5,327,455 Jul. 05, 1994

Claims 1 through 8 and 13 through 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over De Gaudenzi.

Reference is made to the Final Rejection (Paper No. 7, mailed September 3, 1996) and the Examiner's Answer (Paper No. 15, mailed December 9, 1997) for the examiner's complete reasoning in support of the rejection, and to appellants' Brief (Paper No. 14, filed August 29, 1997) and Reply Brief (Paper No. 16, filed February 9, 1998) for appellants' arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will reverse the obviousness rejection of claims 1 through 8 and 13 through 15.

First we note that claim 15 depends from claim 12, now considered allowable by the examiner (Answer, page 8). Accordingly, we reverse the obviousness rejection of claim 15.

Next, we note that the examiner indicates (Answer, page 7) that the rejection of claim 9 is withdrawn because the examiner agrees with appellants that De Gaudenzi fails to

disclose the second phase shifting means for canceling the phase shift of the first phase shifting means. Independent claim 1 recites, in pertinent part, "second phase shifting means for causing the removal of said phase difference of $B/2^n$ between any two reverse-spread digital signals adjacent to one another among the n reverse-spread digital signals, thereby cancelling said phase shift of the first phase shifting means," which is word for word the same as the limitation of claim 9 found lacking from De Gaudenzi. Since we agree with both appellants and the examiner that De Gaudenzi fails to disclose a second phase shifting means, as claimed, we will reverse the rejection of claim 1 and its dependents, claims 2-4, for the same reasons given by the examiner for indicating the allowability of independent claim 9.

Similarly, claim 13 recites, in pertinent part, "phase shifting the n reverse-spread digital signals in order to remove said phase difference of $B/2^n$ between any two reverse-spread digital signals adjacent to one another among the n reverse-spread digital signals, thereby cancelling the first phase shift." Thus, claim 13 includes a step of phase shifting a second time to cancel a first phase shift, which

has been determined to be lacking from De Gaudenzi. Accordingly, we will reverse the rejection of claim 13 and its dependent, claim 14, for the same reasons given by the examiner for indicating the allowability of independent claim 9.

The claims remaining, claims 5 through 8, do not include a second phase shifting step or means. However, independent claim 5 does recite, in pertinent part, "first phase shifting means for causing a phase difference of $B/2^n$ between any two encoded signals adjacent to one another among the n encoded signals."

> The examiner asserts (Answer, page 5) that:
>
> De Gaudenzi recites (Col. 3, lines 39-44), "The way in which coded symbols are associated to the PSK constellation points is properly selected to optimize system performance. The target is to maximize the Euclidean distance between the transmitted signals (signal points)." The Euclidean distance is the distance between the signal points in the constellation. It is clear from this passage that inherent in the De Gaudenzi reference is the use of Gray coding. This allow [sic, allows] the maximum distance between signal points to be determined in such a way to order to lower the BER (optimize system performance) in the system in comparison to other systems in which no mapping was used. And the Gray coding system maps k information bits to the $M=2^k$ possible phases. Therefore, to design the system to have a distance between $B/2^k$ between any two adjacent bits is inherent in the De Gaudenzi reference. The recitation set forth in the De Gaudenzi reference indicates, which out [sic, without] using the exact phrase, that Gray coding is being implemented in the system.

However, appellants state (Brief, page 7) that the claimed phase shifting cannot be inherent because there are other coding schemes which are available as alternatives to the use of Gray Coding. Further, appellants contend (Brief, page 10) that in De Gaudenzi, the phase shift of B/2 is introduced for well-known quadrature modulation, whereas the claim calls for a phase shift of $B/2^n$, where n must be greater than or equal

to 2. In other words, the claimed phase shift must be B/4 or B/8 or B/16, etc., but can never be B/2.

The Court held in *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) that:

> To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. v. Monsanto Co.,* 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient." *Id.* at 1269, 20 U.S.P.Q.2d at 1749 (quoting *In re Oelrich,* 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981).

Thus, to prove that the claimed phase shifting is, in fact, inherent to De Gaudenzi's method and system, the examiner needs to provide extrinsic evidence showing that the claimed phase shifting is necessarily present. However, the examiner provides no such evidence. Further, the examiner fails to respond to appellants' argument that a phase shift of B/2, rather than the claimed phase shift, is introduced by De Gaudenzi. Consequently, we cannot accept the examiner's bald

assertion that the claimed phase shifting is, in fact, inherent to De Gaudenzi's method and system.

In addition, the Court recently held that "[w]ith respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience -- or on its assessment of what would be basic knowledge or common sense." *In re Zurko*, No. 96-1258 (Fed. Cir. August 2, 2001). Thus, as the examiner has provided no reference or evidence of the obviousness of the claimed phase shifting, we decline to find that it would have been obvious. Since the examiner has failed to show with appropriate evidence that De Gaudenzi meets the claimed phase shifting, the examiner has failed to establish a *prima facie* case of obviousness. Accordingly, we cannot sustain the obviousness rejection of claim 5 nor of its dependents, claims 6 through 8.

CONCLUSION

The decision of the examiner rejecting claims 1 through 8 and 13 through 15 under 35 U.S.C. § 103 is reversed.

Appeal No. 1999-1895
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REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
ANITA PELLMAN GROSS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)	

APG:clm

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